THE OCCURRENCE OF THREE SPECIES OF STENOCHITON IN WESTERN AUSTRALIA.

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Introduction.—In my monograph on the Genus *Stenochiton* Ad. and Ang. (Trans. R. Soc. of S.A., Vol. XLII., 1918), I suggested that the distinctive characters of this group warranted its elevation to full generic rank and gave an amended description of its generic characteristics.

All the species at present known are found living on Sea grasses (*Fluviales*). Up to the present I have failed in all attempts to keep them alive in aquariums for observation, so that, while one is fairly confident that they obtain their food from their host plants, this has not yet been satisfactorily demonstrated. Of the five species known all have been described from the State of South Australia and only two previously isolated records exist of their occurrence outside that State. One from Victoria, a single specimen, was wrongly identified by Sykes (Proc. Mal. Soc., Vol. II., pt. 2, July, 1896), as *S. juloides* Ad. and Ang. but was afterwards corrected to *S. pallens* Ashby, by Gatliff and Gabriel. The other is from Western Australia, three valves only, in shell sand at Albany, of *S. juloides* Ad. and Ang. (Torr. Trans. Roy, Soc. of S.A., XXXV., 1911, p. 96).

Now, as the result of the earnest work of Mr. W. B. Alexander, M.A.. Keeper of Biology, Perth Museum, we are able to record the addition of two more species to the fauna of Western Australia, and the fact that *Stenochiton juloides* Ad. and Ang. has now been taken alive in the same State. (I most heartily congratulate Mr. Alexander and his co-workers on obtaining such gratifying results.)

In a letter from Mr. Alexander to myself, dated 12th December, 1919, he says "I am sending you a number of *Chitons*, obtained at the bases of the leaves of *Posidonia australis*, on the shore of Garden Island. I expect that they are specimens of *S. juloides*, A. & A. and S. *Posidonialis* Ashby, but I should be very glad if you would identify them. These were obtained on an excursion made by the Royal Society to the island on December 6." I wrote at once, stating that his identification was quite correct, and I trusted that he would be able to make further search in the situations I had described in my monograph on the *Stenochitons*, and I felt confident that a third species, if no more, would be discovered.

Again, on 13th January, 1920, Mr. Alexander writes, " That he had just returned from another visit to Garden Island and sent a parcel containing representatives of *Onithochiton scholvieni*, Thiele, *Liolophura gagmardi*, Blainville, *Plaxiphora albida*, Blainville, all more or less eroded, and one specimen of *Ischnochiton contractus*, Reeve, and a number of *Stenochiton posidonialis*, Ashby."

These were sent for my identification. While all the *Stenochitons* sent were of the one species, I gathered from his remarks that he had obtained one specimen of *S. cymodocealis*, Ashby, but through some accident or oversight it was not included in the material that reached me.

Mr. Alexander then made an unsuccessful search for the latter species in the beds of Cymodocea at Cottesloe and, finally, on again visiting Garden Island his perseverance was rewarded by finding five specimens of undoubted *S. cymodocealis*, Ashby, on the stems of *Cymodocea* growing in Careening Bay

Descriptions of specimens collected.

Stenochiton juloides, Ad. and Ang. (Proc. Zool. Soc., 1864, p. 193, op. cit. 1865, pl. fig. 15). Ten specimens of this species were sent, all collected at Garden Island, W.A., on the occasion of the Royal Society's excursion to that place on 6th December, 1919, and taken from the leaf blades of the Sea Grass *Posidonia australis*. The largest measures 11mm. in length or about one-quarter the size of a fully developed adult. The shells highly polished and practically unsculptured, of a chocolate colour, in some flecked and streaked with grey. In fact they are similar in all respects to the juvenile shells of this species occurring in South Australia. Unfortunately the specimens in question are covered with a thin film of salt or some preservative fluid, so that unless wetted or varnished, the true colour is not quite clear.

No adult specimens were obtained, probably because only the blades of the ribbon-like leaves were examined. It is necessary to dig or grub up the roots of the *Posidonia* to obtain adult specimens, the *Chitons* living between the brown sheaths of the shoots usually buried in the sand about three inches. This species prefers sheltered beds of *Posidonia* rather than those in more exposed situations.

Stenochiton posidonialis, Ashby (Trans. Roy. Soc. of S.A., Vol. XLII., 1918). A new record for Western Australia.

All the shells were of the usual characteristic shape, long, flat, rounded, smooth, and highly polished. The anterior valve concave and the posterior flat and long, all of a more or less transparent green shade flecked with darker markings, the dorsal line being outlined for the full length, on some specimens, by a wavy pale pink line or band ; the largest about 8mm. in length, whereas I have collected them up to 20mm. in length in South Australia,

but they are more often about the same size as those now under review.

There was a large number of quite juvenile specimens, which suggested from their greater proportional width, that they might be referable to the sub-genus *Zostericola*, Ashby, but they all show the concave anterior valve which is characteristic of the foregoing species.

Variety (1)—Nine of the specimens, or 11 per cent., are transversely banded or blotched with brown on a white ground ; but the shape of the shell is normal, showing that it is only a colour variation. This particular variety was noted in my monograph ; the percentage of this variation to the normal shells is much greater than I have found to be the case in South Australia.

Variety (2)—Four specimens have a dorsal line marked out in brown ; this form also occurs in South Australia and was noted in the paper aforesaid.

Variety (3)—In this specimen there is no distinct colour divergence, but the slope of the anterior valve is almost straight.

Stenochiton cymodocealis, Ashby, (loc. cit.). A new record for Western Australia.

Five specimens were sent me by Mr. Alexander under cover of letter of 4th March, 1920. The largest is a shade over 8mm. in length, the normal colour is olivaceous green to brighter green, dashed with darker green shades, and most show a more or less defined pink dorsal band. They are quite typical, smooth, polished, highly arched, tapering at both ends and the girdle incurved, due to its habit of clinging to the cylindrical stems of the Sea Grass *Cymodocea antarctica*. Mr. Alexander found them in the beds of that plant at Careening Bay, Garden Island. Although he devoted a whole morning to the search he only obtained the five specimens. I think that beds of *Cymodocea* in sheltered positions will later on be found to yield them in greater numbers. Mr. Alexander made careful search for these shells in the beds of *Cymodocea* at Cottesloe without success, but Mr. Shelton, who was with him at the time of the Garden Island excursion, informed him that his school children found some specimens of this *Stenochiton* on one small patch of the same Sea Grass at Cottesloe.

In conclusion, it is with much gratification that I am able, owing to the kindness of Mr. Alexander, to record the foregoing discovery, Western Australia being the first State since the publication of my monograph in 1918 to extend our knowledge of these very interesting chitons. In the said paper I expressed the opinion that investigation by future workers, now we know where and how to search, will reveal many new forms of this genus, not only in the other States of Australia, but also throughout the world, wherever plants belonging to the order Fluviales (Sea Grasses) are found. W.A. has been the first to demonstrate the truth of this prognostication.

C. H. Ostenfeld (Dansk. Botanisk Arkiv. Nr. 6, 1916), states that there are 13 species of Sea Grasses recorded as occurring in Australian waters, seven of which are found in Western Australia. Up to the present I fear we have only searched for *Stenochitons* on two of these, *Posidonia australis* and *Cymodocea antarctica*, and these have been found to be the hosts of four species of *Stenochiton ;* the fifth, *S. pallens*, Ashby, has up to the present only been met with by dredging and its host is not known.

May we not conclude that a diligent search on some of the other species of Sea Grasses will reveal new forms ? I would, therefore, encourage all workers to an earnest search in all localities where these plants grow.